

## CLAIMS

1. A circuit for determining an indication of a length of a conductor, comprising:
  - a terminal for connection to a conductor under test;
  - a pulse source circuit coupled to the terminal for providing a signal to the conductor for use in determining an indication of the length of the conductor;
  - a frequency generator circuit, coupled to the pulse source circuit, for producing first and second frequency signals having a particular relationship; and
  - a mixer, coupled to the frequency generator circuit and the pulse source circuit, for receiving signals related to the first and second frequency signals and for mixing the received signals to produce an output signal.
2. The circuit of claim 1 wherein the frequency generator circuit comprises:
  - a frequency generator producing two frequencies; and
  - a multiplier circuit, coupled to the frequency generator, for receiving the two frequencies and producing the first and second frequency signals, wherein the second frequency signal is a multiple of the first frequency signal.
3. The circuit of claim 2 wherein the multiplier circuit comprises:
  - a phase-locked loop coupled to the frequency generator; and
  - a divide by N circuit coupled to the phase-locked loop.
4. The circuit of claim 2 wherein the multiplier circuit comprises two asynchronous crystal controlled oscillators.

5. The circuit of claim 1 wherein the mixer comprises a sample-hold latch.

6. The circuit of claim 1 wherein the pulse source circuit comprises a circuit for producing a signal having a fifty percent duty cycle of a received signal.

7. The circuit of claim 1, further comprising a length error detector circuit coupled to the pulse source circuit and the mixer.

8. The circuit of claim 1 wherein the terminal is configured for connection to a cable.

9. The circuit of claim 1, further comprising a capacitor coupled between the terminal and the pulse source circuit.

10. The circuit of claim 1, further comprising steering logic coupled between the terminal and the pulse source circuit.

11. A circuit for determining an indication of a length of a conductor, comprising:  
a terminal for connection to a conductor under test;  
a sample-hold latch;  
a re-synchronizer coupled to the sample-hold latch;  
a pulse source coupled to the sample-hold latch, the re-synchronizer, and the terminal;  
and  
a voltage comparator coupled to the pulse source and the terminal.

12. The circuit of claim 11, further comprising a length error detector coupled to the sample-hold latch, the re-synchronizer, and the pulse source.

13. The circuit of claim 11, further comprising an amplifier coupled between the pulse source and the terminal.

14. The circuit of claim 11, further comprising a capacitor coupled between the voltage comparator and the pulse source.

15. The circuit of claim 11, further comprising:

- a first clock coupled to the sample-hold latch; and
- a second clock coupled to the pulse source.

16. The circuit of claim 15, further comprising a squaring flip-flop coupled between the second clock and the pulse source.

17. A method for determining an indication of a length of a conductor, comprising:

- generating first and second frequency signals having a particular relationship;
- mixing signals related to the first and second frequency signals to produce an output signal; and

applying a pulse, based upon the output signal, to a terminal for connection to a conductor under test.

18. The method of claim 17, further comprising:

- receiving a signal from the terminal; and

performing a voltage comparison of the received signal.

19. The method of claim 17 wherein the mixing step includes using a flip-flop to mix the signals.
20. The method of claim 17, further including  
receiving a signal from the terminal; and  
detecting a length error of the conductor based upon the received signal.
21. A method for determining an indication of a length of a conductor, comprising:  
generating first and second frequency signals having a particular relationship;  
mixing signals related to the first and second frequency signals to produce an output signal;  
repeated applying a pulse, based upon the output signal, to a terminal for connection to a conductor under test;  
determining multiple distance measurements based upon the repeated applying step;  
and  
calculating a value, providing an indication of a length of the conductor, based upon the multiple distance measurements.
22. The method of claim 21 wherein the calculating step includes determining an average value of the multiple distance measurements.
23. The method of claim 21 wherein the generating step includes using a phase-locked loop to generate the first and second frequency signals.

24. The method of claim 21 wherein the calculating step includes:

- maintaining a running count of a number of the multiple distance measurements;
- maintaining a running sum of the multiple distance measurements; and
- calculating an average value of the multiple distance measurements using the running count and the running sum.